

**REMARKS**

Entry of the foregoing, reexamination and further and favorable reconsideration of the subject application in light of the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

The Office Action Summary correctly indicates that claims 1-70 are pending in the application. Claims 1-70 are subject to a restriction requirement, which was timely traversed, but has been made final. Claims 1-22 and 30-70 have been withdrawn from consideration. Claims 23-29 have been examined and stand rejected.

By the present amendment, claims 33-70 have been cancelled and claims 71-87 have been added.

New claims 71-72 are supported, at least at pages 13-19 of the specification. New claim 73 recites the subject matter of claim 24, rewritten in independent form. Claims 74-87 depend, directly or indirectly, from new claim 73 and recite subject matter described throughout the specification, for example, at least in original claims 2-11, 15-20, and 25-29.

No new matter has been introduced by way of the above amendments. Applicant reserves the right to file a continuation or divisional application on any subject matter that may have been canceled by way of this Amendment.

### **Restriction Requirement**

Applicant's election, with traverse, of Group 1.3, comprising claims 1-7 and 23-29 has been acknowledged. Applicant's traversal arguments notwithstanding, the requirement has been made final. Further, the Examiner has withdrawn from the position set forth in Paper No. 3 that claims 1-7 are linking claims. The alleged reason is that "claim 23 is not drawn to a 'comparison value' which reflects, as in claim 1, physical properties of proteins." *See*, Paper No. 5 at page 2.

Applicant respectfully submits that the Examiner's original position was correct and that claims 1-7 are, in fact, claims linking each of the sub-groups of Group I. As the Examiner has noted, claim 1 recites "producing a comparison value in response to data values representing physical properties of respective cell signaling proteins." Claim 23 is dependent on claim 1, and further recites "wherein producing a comparison value comprises producing a linkage coefficient as a function of a coexpression coefficient and of a coregulation coefficient."

These recitations are not inconsistent. Considered in the context of the specification, coexpression coefficients and coregulation coefficients are examples of comparison values that are produced "in response to data values representing physical properties of respective cell signaling proteins." Therefore, because the linkage coefficient is produced as a function of the coexpression and coregulation coefficients, which in turn are produced in response to the "data values representing physical properties," the linkage

coefficient itself is produced "in response to data values representing physical properties," as disclosed in the specification and recited in the claims.

Applicant submits that a person of skill in the art would understand from the context of the specification that "physical properties," as recited in claim 1, include the amount and the regulation state of each protein. This is discussed in greater detail below in response to the asserted rejection of claims 23-29 under 35 U.S.C. § 112, second paragraph. Claim 1 recites a comparison value that is produced in response to data values representing physical properties, and claim 23 further describes the comparison value as produced as a function of a coregulation coefficient and a coexpression coefficient. In the context of the specification, these are not inconsistent, as the coexpression and coregulation coefficients themselves are described in the specification as produced in response to the data values representing physical properties, i.e. the amounts and the regulation state of each protein. Moreover, claim 1 and claim 23 are defined using the transitional terms "comprises" and "comprising," which include the possibility that other steps may also be included.

Therefore, Applicant respectfully requests that claims 1-7 be recognized again as linking claims, and accordingly requests that claims 1-7 be reinstated and examined together with the elected claims as indicated on page 2 of Paper No. 3.

The Examiner has requested cancellation of claims 8-22 and 30-70 and the amendment of claims 1-7. However, in view of the foregoing, such an amendment to the application is respectfully not believed to be in order. It is anticipated that, upon finding

that linking claims 1-7 are allowable, the restriction requirement will be withdrawn pursuant to M.P.E.P. § 809, and the whole set of claims comprising Group I (Claims 1-32 and 71-87) will be examined.

### **Formal Drawings**

Applicants note that formal drawings were submitted on April 9, 2003. Entry of the formal drawings is hereby respectfully requested.

### **Rejections under 35 U.S.C. § 112, second paragraph**

Claims 23-29 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite.

In particular, claims 23-29 are rejected for allegedly lacking antecedent basis for the recitation of "producing a comparison value" in claim 23. The apparent reason for the rejection is an assertion that the 'comparison value' of claim 23 is a function of expression and functional properties, which are not 'physical properties' as recited in claim 1. The rejection is respectfully traversed. The use of the term "comparison values" in claims 1 and 23, is consistent with the use of the term "physical properties" as used in the present specification.

Applicant respectfully notes that the test for definiteness under 35 U.S.C. § 112, second paragraph, is whether "those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Orthokinetics, Inc. v. Safety Travel*

*Chairs, Inc.*, 806 F.2d 1565, 1576, 1 U.S.P.Q.2d 1081, 1088 (Fed. Cir. 1986); M.P.E.P. § 2173.02. At page 4 (lines 4-7) of the specification, a method is described as involving "producing and storing a comparison value for each pair of the cell signaling proteins in response to data values representing physical properties of respective cell signaling proteins." In addition, the specification at page 13 (line 16) describes obtaining "[d]ata values representing the physical properties of cell signaling proteins" optionally from prepared samples employing the system shown in Figure 1. A person of skill in the art would appreciate from the specification and knowledge in the art that the system shown in Figure 1, which includes a chemiluminescence imager 300 (page 13, line 24 - or fluorescence imager page 18, line 12) and electrophoresis apparatus 302 (page 13, line 28), could be used to determine band intensity for quantification of given proteins and to quantify the amounts of given proteins in phosphorylated and dephosphorylated forms as described at page 18 (lines 3-20). Furthermore, at page 26 (lines 21-23) the apparatus of Figure 1 is described as being capable of producing "data values representing the physical properties of the kinases, such as their amounts in phosphorylated and dephosphorylated states respectively, for example." Therefore, Applicant respectfully submits that when the claims are read in light of the specification, a person of ordinary skill in the art, would appreciate that "physical properties" as described herein include expression levels and phosphorylation states of proteins. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

Claims 25, 26, 27 are also rejected under 35 U.S.C. § 112, second paragraph, alleging that the metes and bounds of "threshold linkage values" are not defined and that "the term is vague and unclear." The rejection is respectfully traversed. Applicant respectfully directs the Examiner's attention to page 8, lines 3-17, which describes a system, in which a linkage list is generated based on the linkage coefficient values for cell signaling protein pairs. Cell signaling protein pairs are selected for the linkage list based on their having a linkage coefficient value greater than or equal to a "threshold linkage value." Furthermore, as described at page 53 (lines 5-6), in one exemplary embodiment, an appropriate threshold linkage value is given as 0.5. However, it is also clear from the description that "other threshold values may be substituted."

Applicant submits that a person of ordinary skill in the art reading the present specification would be able to determine a "threshold linkage value" commensurate with their needs. Applicant respectfully notes that breadth of a claim is not to be equated with indefiniteness. *See, In re Miller*, 441 F.2d 689, 169 U.S.P.Q. 597 (C.C.P.A. 1971). As stated in M.P.E.P. § 2173.04, "If the scope of the subject matter embraced by the claims is clear, and if applicants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph." Applicant submits that the term "threshold linkage values" although broad, is not unclear when properly construed in light of the specification as a whole. For at least the foregoing reasons, Applicant respectfully requests that the rejection be withdrawn.

**Rejections under 35 U.S.C. § 112, first paragraph, enablement**

Claims 23-29 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly based on a disclosure that is not enabling. The test for enablement is whether one reasonably skilled in the art could make and use the invention from the disclosures in the specification coupled with information known in the art without undue experimentation. *See, M.P.E.P. § 2164.01.* A patent need not teach and preferably omits what is well known in the art. *Id.*

In particular, the Examiner has alleged that the "detection of proteins by electrophoresis and Western blot is described in the specification (e.g. pages 13 through 25) as critical or essential to the practice of the invention, but not included in the claims." The rejection is respectfully traversed.

The specification does not describe the "detection of proteins by electrophoresis and Western blot . . . as critical or essential to the practice of the invention." On the contrary, Applicant's specification at page 13 (lines 16-17), teaches that the collection of data values from samples using electrophoresis and Western blot is an alternative to obtaining data values from commercial or other sources. Features which are merely preferred are not to be considered critical. *See, In re Goffe, 542 F.2d 564, 567, 191 U.S.P.Q. 429, 431 (C.C.P.A. 1976); M.P.E.P. § 2164.08(c).*

Further, the Office Action does not set forth a basis for determining that any experimentation required to perform the method as claimed would be undue. Accordingly, the Applicant respectfully requests that the rejection be withdrawn.

Claims 23-29, also stand rejected under 35 U.S.C. § 112, first paragraph, on the allegation that the specification is not enabling for identifying associations between cell signaling proteins other than kinases. The Examiner acknowledges that the specification is enabling for identifying associations between kinases. The Examiner has also acknowledged that the determination of co-regulation coefficients, based on phosphorylation, is described. However, it is alleged that identification of associations between other cell signaling proteins is not enabled. The rejection is respectfully traversed.

Applicant respectfully submits that a person of ordinary skill in the art would appreciate that a variety of proteins (such as, for example, those described in the specification at page 12, lines 2-12) may be regulated by phosphorylation and dephosphorylation, not just kinases. It is well known that many proteins are regulated by phosphorylation, but are not kinases. One skilled in the art would appreciate that the exemplary procedures described in the specification can be directly applied to such proteins, including for example cytokine and growth factor receptors, ion channels, protein phosphatases, transcription factors, metabolic enzymes, and structural proteins.

Furthermore, a person of ordinary skill in the art would also have known at the time that the application was filed that cell signaling proteins are known to be regulated by various modifications, and that phosphorylation is only one such exemplary modification. For example, one of skill in the art would recognize the well known ubiquitination as another regulatory modification. Ubiquitination can increase apparent molecular weight as

observed in a traditional SDS-polyacryamide gel by about 10 kDa. There are other well known regulatory modifications that may also be observed using methods known in the art, such as glycosylation.

Based on the example of the specification and considering the knowledge in the art of various protein regulatory mechanisms one could generate regulation state data values suitable for producing comparison values for use in the claimed methods. *See*, specification at page 12, lines 10-15. Determining coregulation coefficients for cell signaling proteins is clearly not limited to kinases. Therefore, the claimed methods are fully enabled by the specification. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

Claims 23-29, also stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly not enabled for the use of other mathematical operations for determining linkage coefficients than "division of coregulation coefficient by coexpression coefficient." The rejection is respectfully traversed.

Applicant respectfully submits that a person of ordinary skill in the art would appreciate that certain mathematical operations performed as part of the methods described in the specification could be replaced by other operations in order to achieve the same or an analogous result. The specification, for example at page 50, lines 7-16, makes it clear that the linkage coefficient is produced "as a function of a coexpression coefficient ... and of a coregulation coefficient ..." and that division is merely one example, *i.e.* a particular exemplary embodiment, of such a function, for example, at page 50, line 29 to page 51,

line 7. One of skill in the art would appreciate that there are various ways to achieve an analogous or equivalent comparison value. For example, dividing a first number by a second number is equivalent to multiplying the first number by the second to the exponent -1. Thus, given the teaching of the specification, taken with the knowledge of one of skill in that art, it is respectfully submitted that the methods of claims 23-29 are enabled for the scope of the invention as claimed. Accordingly, withdrawal of the rejection is respectfully requested.

### CONCLUSION

In view of the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order. Such action is earnestly solicited.

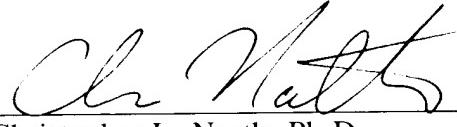
In the event that there are any questions relating to this application, it would be appreciated if the Examiner would telephone the undersigned concerning such questions so that prosecution of this application may be expedited.

Respectfully submitted,

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